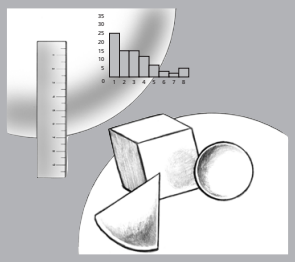
Wisconsin Knowledge and Concepts Examinations
Criterion-Referenced Test

Released Item Book

Mathematics



Grade

10

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Wisconsin Knowledge and Concepts Examinations—Criterion-Referenced Test
(WKCE-CRT)

Released Item Book

What are released items?

The items in this book are actual items from the fall 2005 state assessment, the Wisconsin Knowledge and Concepts Examinations—Criterion-Referenced Test (WKCE-CRT). These items will not be used again on the state assessment and may, therefore, be used in Wisconsin for professional development, improving instruction, and student practice. The items in this book illustrate the formats and kinds of items that students will encounter on the WKCE-CRT.

How do I use this book?

Professional Development

Released items are useful as educators engage in conversations about what students are expected to know and be able to do to demonstrate proficiency on the state assessments relative to the state model academic standards. Released items can inform discussions about state and local standards, curriculum, instruction, and assessment.

Improving Instruction

Teachers may use released items in classroom activities that help students understand how to:

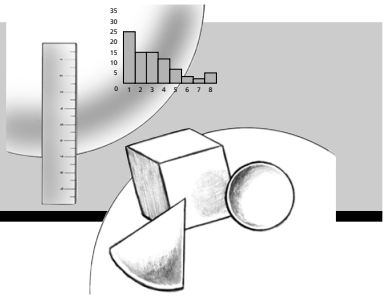
- solve problems
- determine which answer choices are correct, which are incorrect, and why
- respond to constructed response items with complete, thoughtful answers
- approach long and/or multi-step tasks
- use good test-taking strategies.

Student Practice

Students may perform better and with less anxiety if they are familiar with the format of the test and with the types of items they will be required to answer. See the accompanying guide for instructions on administering the released item book as a practice test and for the answer key. Note that a student's score on the practice test cannot be converted to a scale score, used to predict performance on the operational WKCE-CRT, or used to make inferences about the student's learning.

Mathematics

Session 1



1 Which of these ordered pairs is on the graph of $3x - 2y = 12$?

Ⓐ $(^{-}6, 0)$

Ⓑ $(0, 4)$

Ⓒ $(3, 4)$

Ⓓ $(4, 0)$

2 The Raymond Institute increased the number of mathematicians on its staff over the years 1996–2000. The number of mathematicians at the Raymond Institute for each of those years is shown in the table below.

Mathematicians at the Raymond Institute

Year	Number of Mathematicians
1996	32
1997	35
1998	39
1999	44
2000	50

If the pattern in the table continues, how many mathematicians will be at the Raymond Institute in 2004?

Ⓐ 62

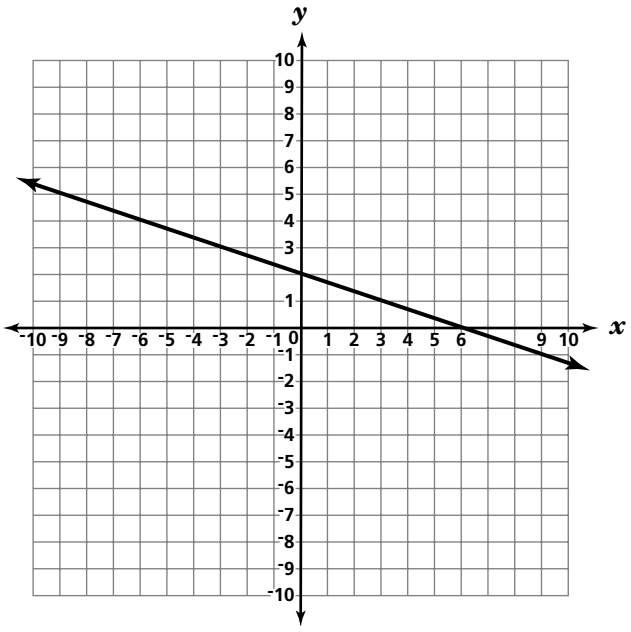
Ⓑ 74

Ⓒ 84

Ⓓ 95

Go On

3 The line $y = \frac{-1}{3}x + 2$ is graphed on the grid below.



Which of these is parallel to the graphed line?

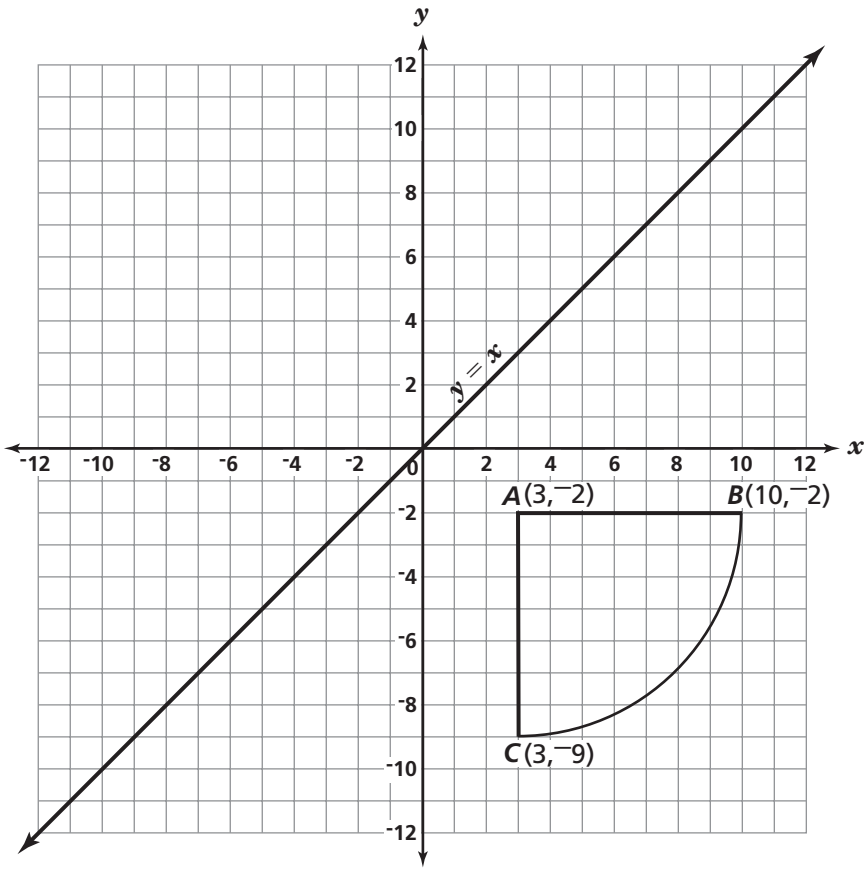
Ⓐ $y = \frac{1}{3}x + 2$

Ⓑ $y = -3x + 2$

Ⓒ $y = 2x + \frac{1}{3}$

Ⓓ $y = \frac{-1}{3}x + 3$

4 Coach Nelson is designing a new park that will have both a baseball diamond and a softball diamond. The baseball diamond will have the same dimensions as the softball diamond. A diagram of the park with the placement of the softball diamond is shown below.



The position of the baseball diamond will be determined by the reflection of the image of the softball diamond about the line $y = x$. What are the coordinates of the reflected image of point C?

Ⓐ (3, 9)

Ⓑ (9, −3)

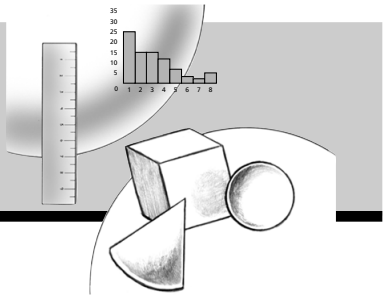
Ⓒ (−9, 3)

Ⓓ (−3, −9)

STOP

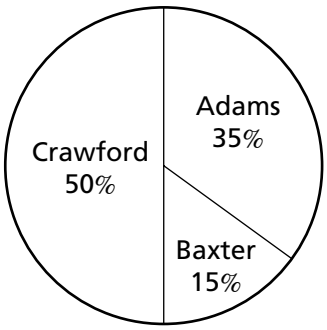
Mathematics

Session 2

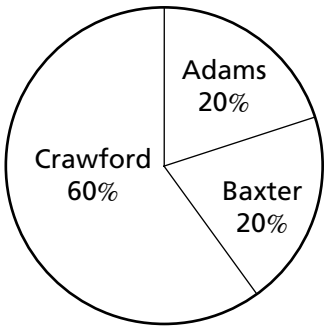


5 Three candidates are running for mayor in the town of Morganville. The local newspaper conducted two surveys asking potential voters for whom they plan to vote. Survey 1 was taken six months before the election and Survey 2 was taken three months before the election. The results of the two surveys are shown below.

Survey 1



Survey 2



Based on the results of both surveys, which of these statements is true?

Ⓐ Crawford will definitely win the election.

Ⓑ More people will vote for Baxter than Adams in the election.

Ⓒ Crawford is spending the most money of the three candidates.

Ⓓ Baxter gained voter support between Survey 1 and Survey 2.

6 An ecologist owns 188,000 square feet of land. She wants to plant trees on 18% of her land. How many square feet of land will be used for planting? Round the answer to the nearest square foot.

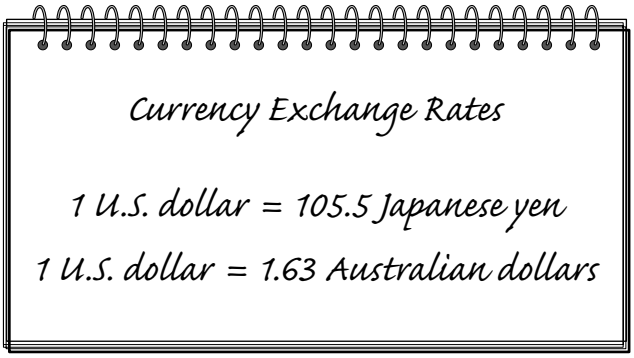
Ⓐ 10,444 square feet

Ⓑ 18,800 square feet

Ⓒ 33,840 square feet

Ⓓ 135,360 square feet

7 Barbara visits Japan and Australia on her vacation. The exchange rates between United States dollars and the currencies of the countries she is visiting are shown below.



When she arrives in Australia, she still has 10,500 Japanese yen. How much is this worth in Australian dollars?

Ⓐ 64.72 Australian dollars

Ⓑ 99.53 Australian dollars

Ⓒ 162.23 Australian dollars

Ⓓ 171.97 Australian dollars

8 The table below contains coordinates for two endpoints of a circle's diameter.

x	y
2	5
-2	5

Which of these points is the center of the circle?

Ⓐ (2, 0)

Ⓑ (6, 5)

Ⓒ (1, 5)

Ⓓ (0, 5)

9 Carla is mowing lawns to earn money for a used car that costs $1,500. Carla's parents have agreed to contribute $1 for every $1 she saves. Carla saves $10 from each lawn she mows. Carla mows 3 lawns per week. Carla estimates that with her parents' help she should be able to purchase the car in 20 weeks.

In the box below, explain whether or not Carla's estimate is accurate. Use mathematics to explain your answer. You may use words, calculations, or diagrams in your explanation.

10 In order to test the effectiveness of a new drug designed to lower blood pressure, a medical researcher creates two testing groups. The dose group will receive the new drug while the other group will be the control group. The control group will receive a placebo, a pill that looks like the real drug but contains no medication at all. Participants will not know whether they are taking the drug or the placebo until after the experiment ends.

What is the role of the control group in this experiment?

Ⓐ to assure that everyone in the dose group takes the drug

Ⓑ to verify that the placebo has no effect on experiment participants

Ⓒ to assure that the people with the highest blood pressure get to take the drug

Ⓓ to verify that any effects seen in the dose group are actually related to the drug

11 At an electronics store, Kara earns a 5% commission on her sales. The table below shows her sales for four weeks.

Kara's Sales

Week	1	2	3	4
Sales	$1,920	$1,680	$3,360	$2,640

What was Kara's total commission for these four weeks?

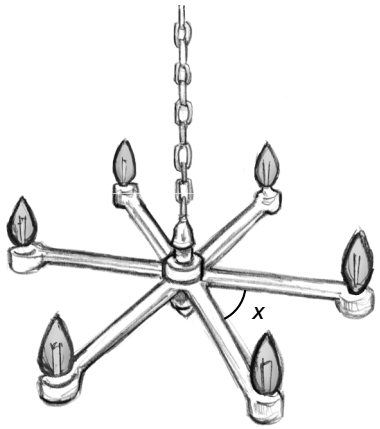
Ⓐ $12

Ⓑ $40

Ⓒ $120

Ⓓ $480

12 A lamp company is designing a light fixture with 6 bulbs. The bulbs are located at the end of six congruent supports as shown below. All the bulbs are evenly spaced around the lamp.



What is the approximate measure of the angle (x) between each support?

Ⓐ 30°

Ⓑ 60°

Ⓒ 120°

Ⓓ 180°

13 The graph below contains pricing information for The Chopper, a kitchen tool that is advertised on television. The price depends on how soon a customer calls after the end of the advertisement.

Pricing of The Chopper

Minutes (m) After Television Advertisement Ends	Price
$0 \leq m \leq 10$	\$34.95
$10 < m \leq 20$	\$39.95
$20 < m \leq 30$	\$44.95
$30 < m \leq 40$	\$49.95
$m > 40$	\$59.95

Approximately how much more would a customer who orders 3 Choppers 23 minutes after the end of the television advertisement pay than a customer who orders 2 Choppers 17 minutes after the advertisement?

Ⓐ \$15

Ⓑ \$35

Ⓒ \$40

Ⓓ \$55

14 The United States imported 9.75 million barrels of petroleum per day in 1999. This represents approximately one-half of the daily petroleum demand in the United States. A barrel holds 42 gallons. According to this information, what was the United States' daily petroleum demand, in gallons, in 1999?

Ⓐ 85 million gallons

Ⓑ 205 million gallons

Ⓒ 397 million gallons

Ⓓ 819 million gallons

15 An engineer knows that a large container holds a volume of 50 gallons of water. For his latest project he needs to find the volume in cubic centimeters. He will use the conversion factors below to convert 50 gallons to cubic centimeters.

Liquid Measure Conversions
1 gallon = 4 quarts
1 liter = 1000 cubic centimeters of water
1 liter = 1.0567 liquid quarts

In the box below, calculate how many cubic centimeters of water are in 50 gallons. Round your answer to the nearest whole number. Use mathematics to explain your answer. You may use words, calculations, or diagrams in your explanation.

Answer: _____ cubic centimeters

16 Look at the figures below.

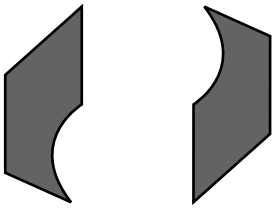


Figure 1 Figure 2

Which of these describes the relationship between Figure 1 and Figure 2?

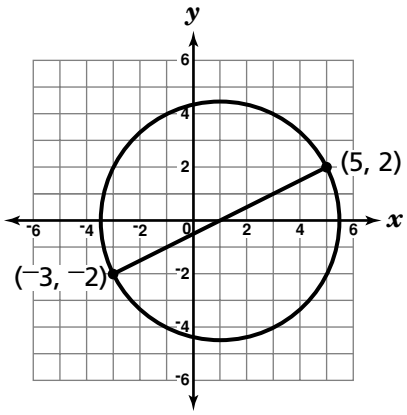
Ⓐ Figure 2 is a translation of Figure 1.

Ⓑ Figure 2 is a 180° rotation of Figure 1.

Ⓒ Figure 2 is a vertical reflection of Figure 1.

Ⓓ Figure 2 is a horizontal reflection of Figure 1.

17 Jill drew a circle in the coordinate plane. She then drew a diameter of the circle from (−3, −2) to (5, 2) as shown below.



What is the length of the diameter of the circle that Jill drew? Round the answer to the nearest unit.

Ⓐ 4 units

Ⓑ 5 units

Ⓒ 9 units

Ⓓ 12 units

Go On

18 The equation shown below can be used to estimate a person's low-density lipoprotein cholesterol (LDL) level, where C is the total cholesterol level, H is the high-density lipoprotein cholesterol level, and T is the level of triglycerides. All measurements are in milligrams per deciliter of blood.

$$\text{LDL} = C - H - \frac{T}{5}$$

A person's lipoprotein analysis results are shown below.

Lipoprotein Analysis Results

Total cholesterol *(C)*	230
High-density lipoprotein *(H)*	50
Triglycerides *(T)*	80

What is this person's LDL level?

Ⓐ 20

Ⓑ 100

Ⓒ 164

Ⓓ 180

19 Hospital A has 360 beds, 30 of which are for critical-care patients. Hospital B is smaller with only 164 beds, 14 of which are for critical-care patients. Which of these statements correctly compares the percentage of critical-care beds at the two hospitals?

Ⓐ Hospital A at 8.3% has a greater percent of critical-care beds than Hospital B.

Ⓑ Hospital A at 12.0% has a greater percent of critical-care beds than Hospital B.

Ⓒ Hospital B at 8.5% has a greater percent of critical-care beds than Hospital A.

Ⓓ Hospital B at 11.7% has a greater percent of critical-care beds than Hospital A.

20 Jared is giving his two friends, Larry and Daryl, a ride home from school. He will drop off Larry first, then Daryl, and then Jared will drive himself home. The chart below shows the number of routes Jared can take for each part of the trip.

Jared's Trip

Part of the Drive	Number of Routes
School to Larry's house	3
Larry's house to Daryl's house	4
Daryl's house to Jared's house	2

How many routes for the entire trip are possible?

Ⓐ 9

Ⓑ 12

Ⓒ 24

Ⓓ 27

STOP

Mathematics Grade 10 Released Item Book

Wisconsin Department of Public Instruction
Elizabeth Burmaster, State Superintendent